

EV Assist

Revolutionizing
EV Assistance with
Generative AI



Introduction

Electric vehicles (EVs) are transforming transportation and driving significant changes in society, the economy and sustainability efforts. Their growing adoption leads to cleaner cities, reduced dependence on fossil fuels and encourages industries to adopt greener practices. Economically, EVs are creating new opportunities in infrastructure and the energy sector.

Generative AI is accelerating this revolution by improving various aspects of the EV ecosystem. It helps optimize battery performance, predict charging needs and personalize the driving experience. With AI-driven insights and automation, automakers and service providers can innovate faster, enhance operational efficiency and create seamless user experiences—leading to a more connected and sustainable future.

Overview

HCLTech EV Assist is an intelligent solution that optimizes the EV driving experience. It provides real-time insights on battery usage, charging infrastructure and personalized driving recommendations to maximize efficiency and reduce range anxiety. The assistant offers proactive support in emergencies, such as finding nearby service centers or scheduling maintenance, ensuring a safer, more convenient drive. By integrating advanced GenAI technology, EV Assistant helps drivers and manufacturers gain valuable insights, improving vehicle performance, customer satisfaction and sustainable innovation.



Key features



Low battery notification and charging assistance

Detects low battery levels and provides details on the nearest available charging stations, including location, availability, charging speed and estimated recharge time.



Range management notifications

Provides real-time alerts when battery levels are low, along with route planning to ensure drivers reach the nearest charging station without running out of power.



Synchronized charging infrastructure information

Offers up-to-date information on nearby charging stations, streamlining the process for drivers by eliminating the need for manual searches.



Driving efficiency recommendations

Analyzes battery levels, destination and driving conditions to suggest speed, eco-mode and route adjustments for optimal efficiency, helping drivers enhance their mileage.



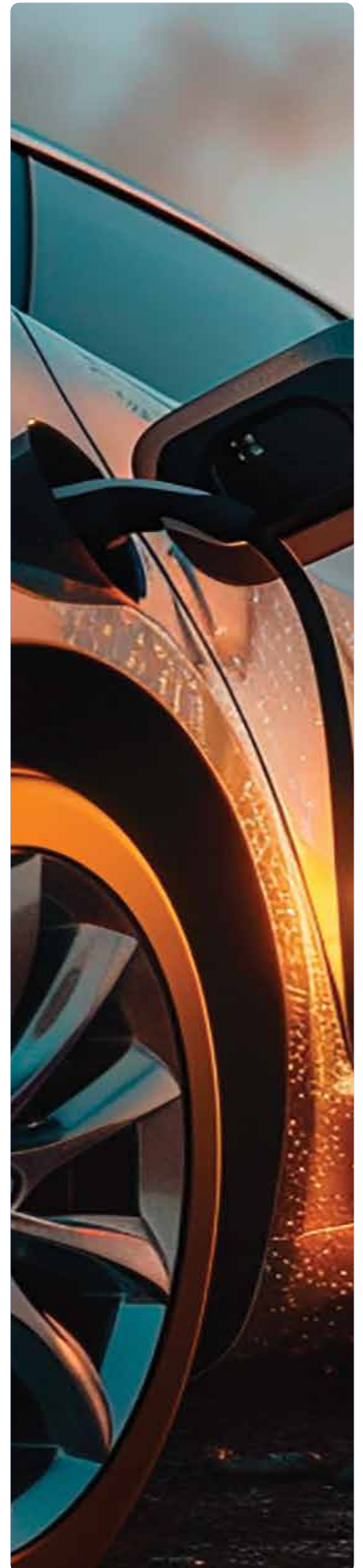
Driving efficiency insights

Analyzes driving habits and provides personalized recommendations on speed and driving techniques to maximize battery life.

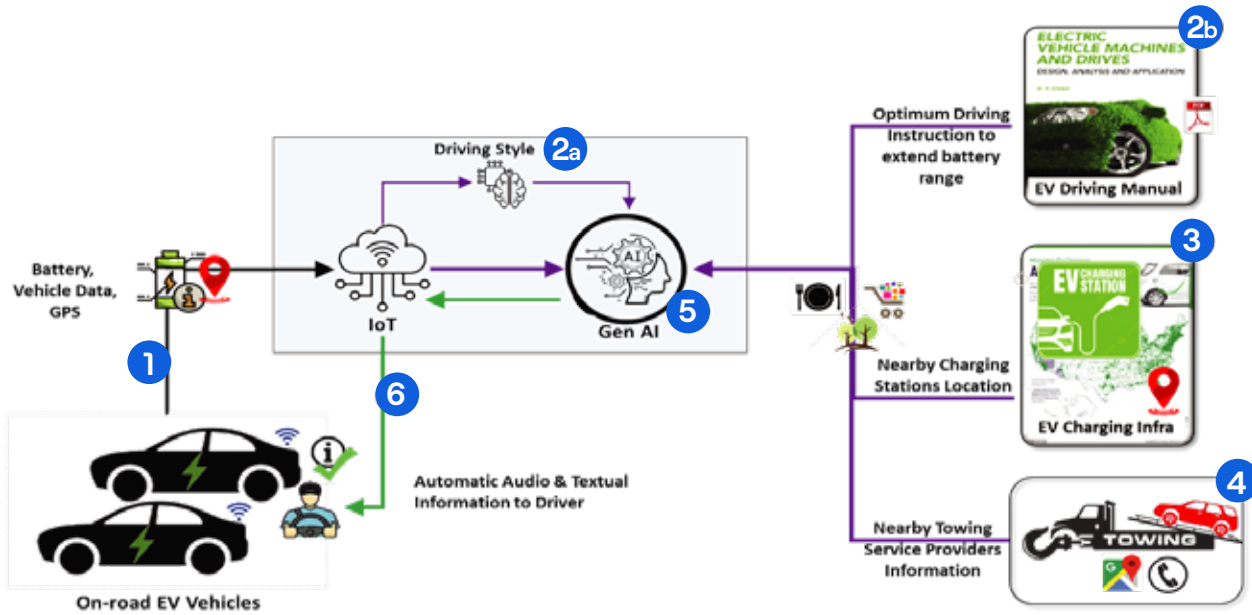


Automated emergency towing service

Connects drivers in critical low-battery situations with nearby towing services, offering details on contact information, response times and fees.



Logical process flow



Flow description

1

IoT Data Collection:
On-road EV vehicles send data related to battery status, vehicle data and GPS coordinates to the IoT system, which continuously monitors this data.

2

Driving Style Analysis:
The AI analyzes the driving style and with RAG provides an optimum driving instruction to extend the battery range. This helps the driver to adjust their driving behavior for better efficiency.

3

Nearby Charging Stations Location:
The Gen AI system identifies nearby charging stations using the current GPS location of the vehicle and informs the driver.

4

Nearby Towing Services:
In case of any issues, the system can identify nearby towing services and provide this information to the driver for assistance.

5

Gen AI Processing Engine:
The IoT data and multi data sources information is processed by the Gen AI system for a synchronized and correlated user-vehicle-infra information to the driver.

6

Automatic Information to Driver:
The system provides automatic audio and textual information to the driver. This includes tips for efficient driving and notifications about the battery status.

Key AWS services used: AWS IoT Greengrass, Amazon S3, Amazon Polly, Amazon Elastic Container Service (ECS), Amazon Bedrock

Benefits



Reduced range anxiety

The solution offers comprehensive and automated information, significantly alleviating drivers' concerns about running out of battery.



Enhanced safety and driving experience

Timely and relevant information empowers drivers to make informed decisions, ensuring safe and efficient vehicle operation.



Seamless integration

The solution leverages existing data sources and integrates smoothly with the vehicle's infotainment system, providing a cohesive user experience.



Increased EV adoption and customer confidence

By addressing range anxiety, the solution fosters greater adoption of electric vehicles and boosts customer confidence in the technology.



Seamless infotainment integration

Synchronized integration possibility with on-board vehicle infotainment systems and navigation map providers.



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